Julian Gutierrez

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I am an ERC Post-Doctoral Researcher in the Department of Computer Science of the University of Oxford. My main research interests are in the areas of logic, game theory, and the mathematical foundations of concurrent and multi-agent systems. At present, I am working in the RACE project, which aims at developing the theory, tools, and techniques required to understand, model, analyse, and formally verify logical and computational properties of game-like concurrent and multi-agent systems.

Professional Track Summary

University of Oxford	ERC Researcher	2012 - Now
University of Cambridge	Research Associate	2011 - 2012
University of Edinburgh	Research Assistant	2010 - 2011
Pontificia Uni. Javeriana	Research Assistant	2005 - 2006

Education

Ph.D. in Informatics. University of Edinburgh. United Kingdom, 2011.
B.Eng. in Computing. Pontificia Universidad Javeriana (PUJ), Cali, Colombia, 2006.
B.Eng. in Electronics. Pontificia Universidad Javeriana (PUJ), Cali, Colombia, 2005.
Bac. diploma in Natural Sciences. Colegio de Santa Librada. Cali, Colombia, 1999.

Academic Honours and Awards

- **Overseas Research Studentship Award.** College of Science and Engineering. University of Edinburgh, UK, 2007-2010.
- **School of Informatics Scholarship Award.** LFCS. School of Informatics. University of Edinburgh, UK, 2007-2010.
- **Honour distinction for excellence in graduation work.** Laureate Thesis Award. Computer Science. PUJ, Cali, 2006.
- **Honour distinction for academic excellence.** For graduation ranking (1st place). Computer Science. PUJ, Cali, 2006.
- **Honour distinction for academic excellence.** For graduation ranking (1st place). Electronics. PUJ, Cali, 2005.
- **INFIVALLE Scholar.** Full scholarship for 5-year university studies, from 1999 to 2004. Cali, Colombia. 1999-2004.
- **Gold Medal 'Francisco de Paula Santander'.** For graduation ranking (1st place). Colegio de Santa Librada, 1999.

Teaching Experience

University of Oxford (Tutor - Merton College). Hilary term, 2013.
Automata, Logic, and Games.

University of Cambridge (Supervisor - Emmanuel College). Michaelmas and Lent terms, 2011 - 2012.
Semantics of Programming Languages, Discrete Mathematics II.

University of Edinburgh (Tutor - Schools of Mathematics and Informatics). From Sep 2008 to Dec 2009.
Mathematics for Informatics (MI2), Computation and Logic (INF1-CL).

Pontificia Universidad Javeriana, Cali (Teaching Assistant - School of Engineering). From Aug 2001 to May 2005.
AI, Operating Systems, Analysis of Algorithms, Fundamentals of Programming, Digital Logic, Microprocessors, Computer Architectures, Discrete Maths, Integral and Differential Calculi, Topics on Classical Physics (I and III).

Research Interests

- Logic and game theory in theoretical computer science and artificial intelligence.
- Semantics and mathematical foundations of concurrent and multi-agent systems.
- Expressiveness, complexity, and formal verification of models for concurrency.
- Mathematical and computational logic: Fixpoint, modal, and temporal logics.

Research Experience

University of Oxford. ERC Post-Doctoral Researcher (Computer Science Department): Nov 2012 - present.
Project: ERC Advanced grant RACE. Principal Investigator: Prof. Michael Wooldridge.

University of Cambridge. Research Associate (Computer Laboratory): Aug 2011 - Oct 2012.
Project: ERC Advanced grant ECSYM. Principal Investigator: Prof. Glynn Winskel.

University of Edinburgh. Research Assistant (Laboratory for Foundations of Computer Science): Sep 2010 - June 2011.
Project: EPSRC grant Solving Parity Games and Mu-Calculi. Principal Investigator: Dr. Julian Bradfield.

Pontificia Universidad Javeriana, Cali. Research Assistant (School of Engineering): Jan 2005 - Jun 2006.
Principal Investigators: Prof. Camilo Rueda and Dr. Frank D. Valencia.

PUBLICATIONS

Summary of *selected* journal papers and peer-reviewed articles (2xLICS, IJCAI, KR, 2xCONCUR, FOSSACS):
I have published 4 SJR-Scopus Q1, 7 SJR-Scopus Q2, and 4 CORE A* papers.

PHD THESIS

On Bisimulation and Model-Checking for Concurrent Systems with Partial Order Semantics.
J. Gutierrez. *Ph.D. Thesis* Laboratory for Foundations of Computer Science (LFCS), University of Edinburgh, UK. 2011.
This thesis appears in the Edinburgh Research Archive. Available online at https://www.era.lib.ed.ac.uk/handle/1842/5281

INTERNATIONAL JOURNALS

Iterated Boolean Games.
J. Gutierrez, P. Harrenstein, M. Wooldridge.
In *Information and Computation*, Elsevier (ISSN 0890-5401, SJR Q1), To appear.

On Fixpoint Logics and Equivalences for Processes with Restricted Nondeterminism.
J. Gutierrez.
In *Journal of Logic and Computation*, Oxford University Press (ISSN 0955-792X, SJR Q2), To appear.

On the Determinacy of Concurrent Games on Event Structures with Infinite Winning Sets.
J. Gutierrez and G. Winskel.
In *Journal of Computer and System Sciences*, Elsevier (ISSN 0022-0000, SJR Q1), 2014.

The Mu-Calculus Alternation Hierarchy Collapses over Structures with Restricted Connectivity.
J. Gutierrez, F. Klaedtke, M. Lange.
In *Theoretical Computer Science*, Elsevier (ISSN 0304-3975, SJR Q1), 2014.

Model-Checking Games for Fixpoint Logics with Partial Order Models.
J. Gutierrez and J. Bradfield.
In *Information and Computation*, Elsevier (ISSN 0890-5401, SJR Q1), 2011.

PEER-REVIEWED ARTICLES

Equilibria of Concurrent Games on Event Structures.
J. Gutierrez and M. Wooldridge. In *LICS-CSL*, ACM/IEEE (ISBN 978-1-4503-2886-9, CORE A*), 2014.

Reasoning about Equilibria in Game-like Concurrent Systems.
J. Gutierrez, P. Harrenstein, M. Wooldridge. In *KR*, AAAI (ISBN 978-1-57735-657-8, CORE A*), 2014.

Iterated Boolean Games.
J. Gutierrez, P. Harrenstein, M. Wooldridge. In *IJCAI*, IJCAI/AAAI (ISBN 978-1-57735-633-2, CORE A*), 2013.

Borel Determinacy of Concurrent Games.
J. Gutierrez and G. Winskel. In *CONCUR*, LNCS, Springer (ISSN 0302-9743, SJR Q2), 2013.

Imperfect Information in Logic and Concurrent Games.
P. Clairambault, J. Gutierrez, G. Winskel. In *LNCS*, Springer (ISSN 0302-9743, SJR Q2), 2013.

The Winning Ways of Concurrent Games.
P. Clairambault, J. Gutierrez, G. Winskel. In *LICS*, IEEE (ISBN 978-1-4673-2263-8, CORE A*), 2012.

The Mu-Calculus Alternation Hierarchy Collapses over Structures with Restricted Connectivity.
J. Gutierrez, F. Klaedtke, M. Lange. In *GANDALF*, EPTCS (ISSN 2075-2180), 2012.

Concurrent Logic Games on Partial Orders.
J. Gutierrez. In *WoLLIC*, LNCS, Springer (ISSN 0302-9743, SJR Q2), 2011.

Model-Checking Games for Fixpoint Logics with Partial Order Models.
J. Gutierrez and J. Bradfield. In *CONCUR*, LNCS, Springer (ISSN 0302-9743, SJR Q2), 2009.

Logics and Bisimulation Games for Concurrency, Causality and Conflict.
J. Gutierrez. In *FOSSACS*, LNCS, Springer (ISSN 0302-9743, SJR Q2), 2009.

Timed Concurrent Constraint Programming for Analysing Biological Systems.
J. Gutierrez, J. A. Perez, C. Rueda, F. D. Valencia. In *ENTCS*, Elsevier (ISSN 1571-0661, SJR Q2), 2007.

Timed CCP in Systems Biology.
A. Arbelaez, J. Gutierrez, J. A. Perez. In *The ALP Newsletter*. Association for Logic Programming, Vol 19, No 4, 2006.

Modelamiento de Sistemas Biológicos usando Cálculos de Procesos Concurrentes.
J. Gutierrez, J. A. Perez, C. Rueda. In *Epiciclos Scientific Journal*, Colombia, PUJ-Cali (ISSN 1657-5636), 2005.

KEYWORDS: theoretical computer science, artificial intelligence, mathematical logic, concurrent and multi-agent systems, game theory, formal verification, complexity theory, semantics and mathematical foundations, theory of computation.

PROFESSIONAL ACTIVITIES

PC member.

IJCAI'15, ICTAC'15, AAAI'15, AAAI'14, CLEI'14, CLEI'13, SICSA'10, and ICE'10.

Reviewer.

- For *journal* articles in: Journal of the ACM, Journal of Logic and Computation, Journal of Automated Reasoning, Journal of Information and Computation, JAAMAS, and the Scientific Annals of Computer Science.
- For AI and Computer Science *conference* papers submitted to: LICS'15, IJCAI'15, AAAI'15, LICS'14, AAAI'14, CP'14, FSTTCS'14, IJCAI'13, CONCUR'13, LICS'12, SOFSEM'12, and CONCUR'10.
- For two *books*: technical reviews, which appeared in the Bulletin of Symbolic Logic, for 'Introduction to Bisimulation and Coinduction' and 'Advanced Topics in Bisimulation and Coinduction' published by Cambridge University Press.

Evaluation committees.

1. Eng.D. (Doctorate) thesis: 'Formal Methods for the Specification and Verification of Distributed and Timed Systems'. By Dr. James Jerson Ortiz Vega. Universidad del Valle, Cali, Colombia, 2012.
2. M.Eng. (Master) thesis: 'Formal Verification of an Event-B to JML Translation'. By Mr. Shigeo Armando Nishi Lozano. Pontificia Universidad Javeriana, Cali, Colombia, 2014.

Invited Speaker.

1. OASIS Seminar (Oxford, 2009),
2. Theoretical Computer Science Seminar (Birmingham, 2010),
3. Schloss Dagstuhl Seminar (Dagstuhl, 2010),
4. Logic and Semantics Seminar (Cambridge, 2011),
5. LFCS Seminar (Edinburgh, 2013),
6. Heidelberg Laureate Forum (Heidelberg, 2014),
7. Mathematical Foundations Seminar (Bath, 2014),
8. Theory Group Seminar (Queen Mary University of London, 2014),
9. Department of Computing Seminar (Imperial College of London, 2014).

Scientific events organisation.

- 26th British Colloquium for Theoretical Computer Science (BCTCS 2010) in Edinburgh, Scotland. Part of the local organisation committee.
- 3rd International Workshop on Strategic Reasoning (SR 2015) in Oxford, England. Part of the local organisation committee.
- 12th International Colloquium on Theoretical Aspects of Computing (ICTAC 2015) in Cali, Colombia. Part of the scientific organisation committee.

Students.

1. Matvey Soloviev: 'A Model Checker for Independence-Friendly Modal Logic'. University of Cambridge BSc project, 2011-2012. Role: Originator and co-supervisor.
2. Alexis Toumi: 'Branching Temporal Logic, Automata and Games'. University of Oxford BSc project, 2014-2015. Role: Main supervisor.

ADDITIONAL INFORMATION

PROGRAMMING SKILLS Knowledge of imperative, functional, and object-oriented programming languages. Also, experience with some concurrent, logic, and constraint programming environments as well as some low-level programming and hardware description languages. Programming experience of software applications for Mac, Linux, and Windows platforms.

LANGUAGES English and Spanish.

REFERENCES

Prof. Michael Wooldridge	Hertford college Fellow and Head of Department (Computer Science)	*Oxford*
Prof. Glynn Winskel	Emmanuel college Fellow and University Professor (Computer Laboratory)	*Cambridge*
Dr. Julian Bradfield	University Reader and former LFCS Director (School of Informatics)	*Edinburgh*
Dr. Andres Jaramillo	Research Scientist and Director of Multiscale Science and Simulation	*Caltech*